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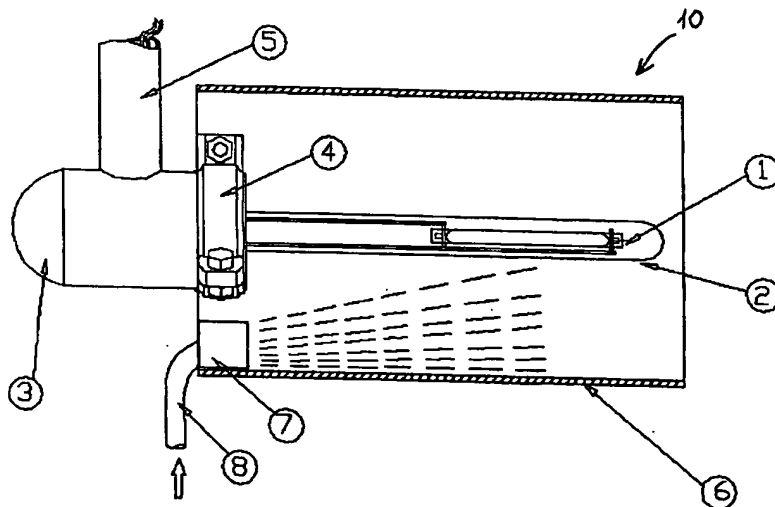
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(54) Title: A METHOD AND AN APPARATUS FOR PURIFYING WATER BY PHOTO-CHEMICAL OXIDATION



(57) Abstract: The present invention concerns an apparatus for purifying contaminated water by photochemical oxidation, wherein at least a sub-flow of water is directed through a flow channel wherein the water is irradiated with UV electromagnetic radiation from at least one UV lamp assembly, wherein said at least one UV lamp assembly includes a high-pressure UV halogen lamp which is mounted generally parallel with the flow direction in the channel. Moreover, a method is also provided, whereby the water flow is radiated with UV radiation by at least on UV halogen high-pressure lamp assembly, which is energy intensive wave lengths in the range of 150 nm to 260 nm, preferably in the range of 160 nm to 220 nm, and most preferably in the range of 192 nm to 205 nm.

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK 03/00795

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 C02F1/32 C02F1/72

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C02F H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 348 665 A (SCHULTE PETER ET AL) 20 September 1994 (1994-09-20) column 2, line 36 - line 44 column 3, line 35 - line 49 column 4, line 20 - line 27 column 5, line 20 - line 26; claims 6,7; figures 1,3	1,5-11, 15-19
Y	US 6 447 721 B1 (GARRETT KURT ANTHONY ET AL) 10 September 2002 (2002-09-10) column 1, line 20 - line 65 column 4, line 48 - line 57 column 11, line 60 - column 12, line 9 column 12, line 57 - line 59; claim 6 --- -/--	1,5-11, 15-19



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	<p>WO 03 022749 A (RIED ACHIM ;WEDECO AG  WATER TECHNOLOGY (DE))  20 March 2003 (2003-03-20)  page 6, line 20 - line 28  page 8, line 18 - line 33  abstract</p>	1-19
A	<p>---  US 5 324 438 A (MARTIN PAUL ET AL)  28 June 1994 (1994-06-28)  column 3, line 17 - line 19; figure 1;  example 1  abstract</p> <p>-----</p>	1-19

# INTERNATIONAL SEARCH REPORT

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5348665	A	20-09-1994	DE 4138421 A1 AT 123272 T DE 59202400 D1 EP 0543112 A1 JP 2503351 B2 JP 6285480 A	27-05-1993 15-06-1995 06-07-1995 26-05-1993 05-06-1996 11-10-1994
US 6447721	B1	10-09-2002	US 6447720 B1 EP 1353704 A2 WO 02092514 A2 AU 7809001 A EP 1322341 A1 WO 0209774 A1 US 6403030 B1	10-09-2002 22-10-2003 21-11-2002 13-02-2002 02-07-2003 07-02-2002 11-06-2002
WO 03022749	A	20-03-2003	DE 10144510 A1 CA 2433133 A1 WO 03022749 A1 EP 1320513 A1 US 2004031762 A1	03-04-2003 20-03-2003 20-03-2003 25-06-2003 19-02-2004
US 5324438	A	28-06-1994	AU 5460294 A WO 9412436 A1	22-06-1994 09-06-1994